House will, on this occasion, be transferred to York, and Earl Fitzwilliam will, as president of the Yorkshire Philosophical Society, entertain a very large party of the visitors at dinner, in the De Grey rooms, on Friday. We hear also that the archbishop, the highly respected patron of the society, and a constant friend and supporter of every useful design in York, will receive at Bishopsthorpe many distinguished members of the association, and exercise towards others that graceful hospitality, which operated so favourably to cement together, in 1831, the various elements that now compose the body of the association. The Earl of Enniskillen and the Earl of Rosse have also made arrangements to enable them being present on the 28th inst.

MINERALOGY.

BY HENRY G. MONTAGUE, ESQ., PROFESSOR OF NATURAL PHILOSOPHY.

(*Continued from p.* 479.)

A few more years, and the dreamy speculations of geologists will have disappeared for ever; the mind of man has hitherto constantly tended to speculate on impossibilities, and in doing so, shuts itself out from nature, and the natural simplicity of truth. What reasoning being can follow the absurd calculations and mathematical demonstrations of modern philosophers? One tells you exactly how old the earth is; another measures out its sum of air and water, of hydrogen, oxygen, nitrogen, and carbon; another gives a section of the interior of the globe, and describes its composition, how long our hidden recesses of coal will last—how many miles high our atmosphere exists—how the inhabitants of tropic climes could live in frigid regions—how nature plays the see-saw game of elevation and depression, as though animated by a vital, thinking principle—how millions of worlds may be seen in the sweep of a telescope—how this earth is a huge high-pressure engine, regulating itself by funnels and safety-valves, and avenging itself by awakening our fears, destroying the fruits of our labours, and hurrying tens of thousands into eternity by its momentary summons. These are the absurdities of science, which men love to hear, in preference to the simplicity of truth; and upon which literary empirics found their fame and fleeting popularity, striking the weak mind with awe and wonder, appealing to its prejudices and superstitions, rather than to its reasoning powers. In the days of Woodward every fossil body was a *lusus naturæ*, or plastic freak of nature; and the theories of Bishop Burnet, Whiston, and others, are existing monuments of the taste and superstitions of the day. We have since those times advanced in knowledge at a railway pace, but our thinking faculties do not keep pace with the knowledge acquired; the bulk of the community still sigh after or adhere to the marvellous, even though it convict them of folly and inconsistency.—Empiricism will flourish!

In continuing the subject-matter of Petralogy under the more comprehensive term of Mineralogy, I do so in order to treat more at length on the nature and qualities of earths, which form the bases of rocks and stones. It will be understood by every one, that the rocks, and the materials of which they are composed, are so intimately associated together, and are so dependant on each other, as to be inseparable; that rock may be seen in every stage of decomposition, and in every stage of formation, from the forming concrete to the highest crystalline rock. Under the head of calcareous substances I must, therefore, naturally embrace many bodies embraced under the head of petralogy.

I have already spoken of the origin of calcareous earths, and, influenced by climate and association, their conversion into rock; but when limestone or marble is subjected to the process of burning, calcareous earth is again produced, and in this state is commonly known under the name of lime, the purest of which is yielded by calcareous spar and some white marbles. Limestone is said to be composed of lime and carbonic acid, because chemists, on the application of heat, extract a gaseous body from it, which by Priestly, Black, and others, was termed fixed air, but latterly denominated carbonic acid gas, still it is very questionable, as I have observed elsewhere, whether carbon forms the actual cementing base of the lime stone. In 1808 Sir Humphrey reduced lime to a metal, having the colour and lustre of silver, and burning with an intense white light into quick lime.

Gypsum, commonly called plaster of Paris, is a carbonate of lime combined with sulphuric acid; the plaster of Paris being prepared from gypsum by calcination; the varieties employed for this purpose by the ancients were chiefly *alabastrites* or *alabastrum*, effervescing with nitrous acid; but moderns have applied the name of alabaster to quite a distinct substance, which being united with sulphuric acid, the nitrous acid produces no effect. The alabastrites of the Romans were most probably, according to the description given of them by Pliny primarily derived from Egypt only, whence they obtained their porphyries, and other precious building stones; for Egypt, as is manifest in the present day, abounds with this material, particularly in the neighbourhood of the ancient quarries; it exhibited, in general, a stratified appearance, was distinguished by its yellow colour, and often by brown stripes, arising from successive depositions, with some resemblance of the layers of the onyx, whence the onyx baths and pavements of the ancients. Burckhardt notices vast quantities of it in the hills near Cossier. Pliny says, our ancestors thought that onyx was only produced in the mountains of Arabia, and in no other region; it is, therefore, probable that the Romans themselves were not certain at the first of the precise spot where it was procured. It is exceedingly abundant in the chains and groups of hills and mountains running parallel to the Red Sea, and on both sides of it. At first only drinking vessels were made of it; but afterwards the feet of beds, and even seats. Cornelius Nepos says that "It was reported a great wonder when P. Lentulus Spinteo displayed amphoræ of onyx as large as Chian casks; yet five years after he saw columns 32 feet in length. But from more refinement in the choice of this stone, four columns of a middling size, placed by Cornelius Balbus in his theatre, were esteemed monuments of surprising grandeur. We have seen more than thirty in the dining-hall, which Callistus, well known by his power among the freemen of the emperor Claudius, had erected at a great expense."

"Some have called this stone alabastrite: and of it little pots or boxes for ointments are formed, as in them it is supposed less liable to corrupt. When calcined, it is also used for plaster. It is produced towards Thebes, in Egypt, and near Damascus in Syria; but this last is white, and little esteemed. The best is from Carmania, the next from India, and a valuable sort is also found in Syria and Asia Minor. The worst, and that without any splendour, is that of Cappadocia. They are chiefly approved when of a honey yellow, with orbicular clouds, and little translucent. It is esteemed of little value when of a horn colour, or white, or of a glassy appearance." This peculiar marble of the ancients has been latterly found in small pieces at Mont Martre, near Paris; in Spain, in rocky masses of great beauty; and, it is said that the territory of Volterra, in Tuscany, affords no less than twenty remarkable varieties.

Patrin says, those most esteemed are the agate alabasters, to which this name is given on account of their fineness; and the onyx alabasters, which present clear and distinct layers of different colours, all of them undulated and festooned, with salient and re-entering angles, like the zones of fortification agates, of which the whole forms a figure nearly circular. The formation of these zones is owing to a play of crystallization, like that of agates; and in like manner they are always found exactly parallel among themselves, what-ever may be the irregularity of their course. A perpetual circulation takes place in the interior of the alabaster, while it is still in its natural site, which arranges the various particles, of which it is composed, according to the laws determined by their mutual affinities.

The onyx alabaster is sometimes formed in sheets on a horizontal plane; and then these layers, instead of forming re-entering courses, describe straight lines, or slightly undulated; and as these layers are of lively marked colours, such as the white and red, cameos may be made of them, as they are of onyx agate.

The onyx alabaster of Sienna is of the utmost beauty; it presents layers of three bright and distinct colours—yellow, red, which is opaque, and white, which is very transparent. The other alabasters of Italy, which are most valuable, are the agate alabaster of Sienna, which is nearly transparent, and of a fine uniform yellow; *pecorino*, which is transparent, of a uniform fawn colour, or mingled with brown veins. Malta also furnishes various alabasters, and particularly one of the colour of wax, like the agate alabaster of Sienna; its paste is of the greatest fineness, and of a beautiful semi-transparency. The name of oriental alabaster is given to that which adds to a fine paste lively and distinct colours, and a hardness which renders it susceptible of a fine polish.

The celebrated sculptor Puget discovered, near Marseilles, an alabaster so transparent, that the eye could penetrate into the interior of the substance, and, to the depth of two fingers, trace the beautiful tints with which it was coloured. Guellard says that the waters of Aix, in Provence, form a deep brown alabaster, mingled with whitish zones, which make it resemble the oriental kind. This alabaster is found in an ancient conduit, built by the Romans, which brings the water from a spring about half a league from the town.

At Montmatre, and in the other hills of plaster-stone in the environs of Paris, and especially at Laguy it is very abundant, resembling the fine oriental stone; but this is, in reality, a stalactitic gypsum, which takes but a slight polish, and is much less brilliant.

Alabaster, from its beauty, and the great facility of working it, has always been in great demand as a building material; it is used for ornamental architecture and sculpture, and in climates favourable for its preservation might safely be used for the entire structure. The ancients were very fond of this material, and went to enormous expense in procuring the most varied and beautiful kinds from all parts of the world. The Temple of Fortune, built wholly of that species called *phengites*, has long been famous. Its great beauty being in its transparency, from which alone this temple was perfectly light when the doors were shut, though it was built without a window, and had no other light but what was transmitted through the stone its walls were built with. It was anciently found in Cappadocia, and is still plentiful there, as also in Germany, France, and Derbyshire in this country. It takes an excellent polish, and is very fit for ornamental works, when there is no great strength required. Other writers observe that *phengites* seem more applicable to a marble capable of reflecting light like a mirror, than to one transparent; and Suetonius, in his life of Domitian, observes of this monarch, that "fearful of being assassinated, he lined, in various places, the walls of the portico where he used to walk, with the stone called phengites, by the reflection of which he could see every object around him."

The extreme solubility of the stone renders it ill-suited to resist atmospheric action. Dr. Watson tells us that he suspended two ounces of alabaster in a pail of water forty-eight hours, changing the water several times, and found that it had lost one-thirtieth part of its weight; but little in reality can be gathered from this experiment, for some alabasters are so soft, as to be little better than concrete masses. There is a kind of alabastrite called in Italy *fiorito*, implying that it is marked with irregular spots faintly resembling flowers. Two columns of this kind, according to Brard, are placed in the Museum at Paris; they were discovered in 1780, in the ruins of Galbium, four leagues from Rome.

Common alabaster is generally of compact texture, resembling the hardest loaf sugar; sometimes it exhibits the fibrous structure: the colour is generally of the purest white, sometimes slightly tinted with grey; but when stalactitic, its veins are sometimes yellow and brown, by erriginous infiltrations; at the old passage near Bristol, they assume a rose colour; in Nottingham they appear blue.

Alabaster, like alabastrite, is generally regarded by mineralogists as being a sinter or deposition; on the shores of Africa and Arabia it is often found interposed in thin plates or successive layers in the small calcareous hills, at other times it is evidently produced by sedimentary deposition in undisturbed waters. M. Gruelin says that it forms entire mountains, and it is certain that there are immense formations of this material crowning the vast heights of America. In many parts of the deserts it forms immense strata, being evidently the

For information